

Duct Sensor Humidity / Temperature

Active sensor (0...10 V) for measuring the relative or absolute humidity and temperature in duct applications. Instead of the humidity signal, the enthalpy or the dewpoint can be selected as an output signal. NEMA 4X / IP65 rated enclosure.



Type Overview

| Type | Output signal active temperature | Output signal active humidity | Output signal passive temperature |
|------------|----------------------------------|-------------------------------|-----------------------------------|
| 22DTH-11M | DC 0...5 V, DC 0...10 V | DC 0...5 V, DC 0...10 V | - |
| 22DTH-11MM | - | DC 0...5 V, DC 0...10 V | NTC10k Pre (10k3) |

Technical Data

| | | | | | |
|------------------------------|---|---|-------------|--------------|-----------------|
| Electrical data | Power Supply DC | 15...24 V, ±10%, 0.4 W | | | |
| | Power Supply AC | 24 V, ±10%, 0.8 VA | | | |
| | Electrical connection | Removable spring loaded terminal block max. 2.5 mm ² | | | |
| | Cable entry | cable gland PG11 Ø6...10 mm, with strain relief Ø6...8 mm | | | |
| Functional data | Sensor Technology | Polymer capacitive sensor with stainless steel wire mesh filter | | | |
| | Multirange | YES | | | |
| | Output signal active note | Output DC 0...5/10 V with Jumper adjustable Voltage output: min. 10 kΩ load | | | |
| | Media | Air | | | |
| Measuring data | Measured values | Temperature Humidity Dew point Enthalpies Absolute humidity | | | |
| | Measuring range humidity | 0...100% rH non-condensing | | | |
| | Measuring range temperature | Passiv Sensor: depending on sensor type range selectable | | | |
| | | Setting | range [°C] | range [°F] | Factory setting |
| | | S0 | -40...60 °C | -40...160 °F | |
| | | S1 | 0...50 °C | 40...140 °F | |
| | | S2 | -15...35 °C | 0...100 °F | |
| | S3 | -20...80 °C | 0...200 °F | ✓ | |
| | Measuring range absolute humidity | adjustable at the transducer: 0...50 g/m ³ (default setting) 0...80 g/m ³ | | | |
| | Measuring range enthalpy | 0...85 kJ/kg | | | |
| Measuring range dew point | adjustable at the transducer: 0...50 °C (default setting) -20...80 °C | | | | |
| Accuracy humidity | ±2% between 10...90% rH @ 21 °C | | | | |
| Accuracy temperature | ±0.5 °C @ 25 °C | | | | |
| | NTC10k Pre (10k3): ±0.2 °C @ 25 °C | | | | |
| Operating condition air flow | max. 12 m/s | | | | |

| | | |
|--------------------|------------------------------|--|
| Materials | Cable gland | PA6, black |
| | Housing | Cover: Lexan, Belimo orange NCS S0580-Y6OR Bottom: Lexan, Belimo orange NCS S0580-Y6OR Seal: 0467 NBR70, black |
| Safety data | Ambient Temperature | -20...50 °C [-5...122 °F] |
| | Operating condition air flow | max. 12 m/s |
| | Protection class IEC/EN | III Safety Extra-Low Voltage (SELV) |
| | Protection class UL | UL Class 2 Supply |
| | EU Conformity | CE Marking |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-13 |
| | Certification UL | pending |
| | Degree of protection IEC/EN | IP65 |
| | Degree of protection NEMA/UL | NEMA 4X |
| | Quality Standard | ISO 9001 |

Remarks
Build-up of Self-Heating by Electrical Dissipative Power

Temperature sensors with electronic components always have a dissipative power which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. This dissipative power should be taken into account when measuring temperature. In case of a fixed operating voltage (± 0.2 V) this is normally done by adding or reducing a constant offset value. As Belimo transducers work with a variable operating voltage, only one operating voltage can be taken into consideration, for reasons of production engineering. Transducers 0...10 V / 4...20 mA have a standard setting at an operating voltage of DC 24 V. That means, that at this voltage, the expected measuring error of the output signal will be the least. For other operating voltages, the offset error will be increased by a changing power loss of the sensor electronics. If a re-calibration should become necessary later directly on the sensor, this can be done by means of a trimming potentiometer on the sensor board.

Application Notice for Humidity Sensors

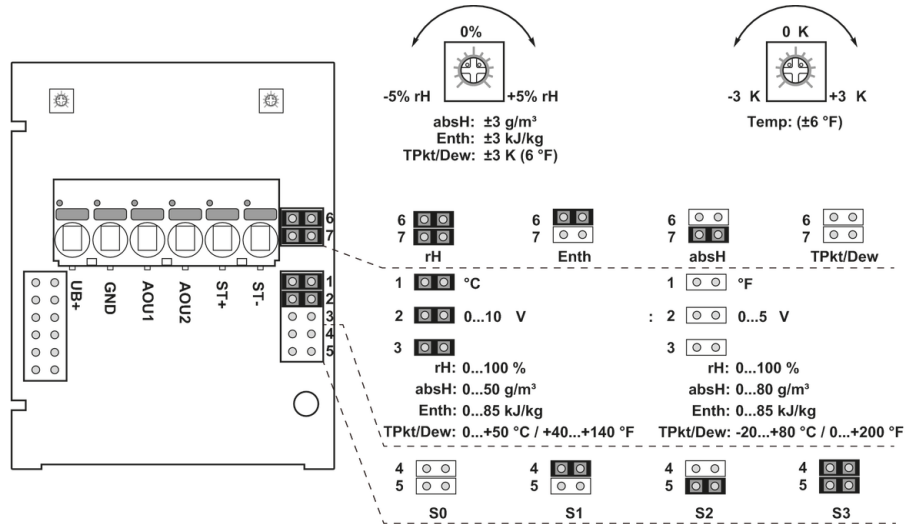
Refrain from touching the sensitive humidity sensor/element. Touching the sensitive surface will void warranty.

For standard environmental conditions the manufacturing accuracy specified in the datasheet will be covered by the calibration warranty for two years. When exposed to harsh environmental conditions such as; high ambient temperature and/or high levels of humidity or presence of aggressive gases (i.e. chlorine, ozone, ammonia) the sensor element may be affected and readings may be outside specified accuracy. Replacement of deteriorated humidity sensor due to harsh environmental conditions are not subject of the general warranty.

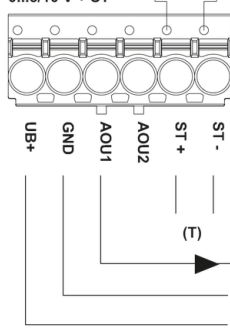
Accessories

Scope of delivery Mounting flange

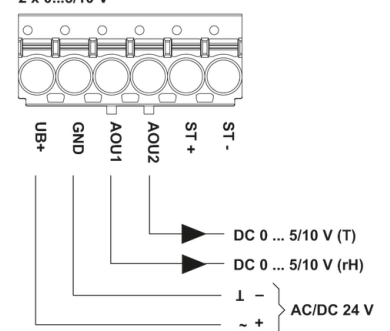
Wiring diagram



22..TH-..1..
0...5/10 V + ST



22..TH-..1..
2 x 0...5/10 V



rH Relative humidity
absH Absolute humidity
Enth Enthalpy
TPkt/Dew Dew point

The adjustment of the measuring ranges is made by changing the bonding jumpers. The output value in the new measuring range is available after 2 seconds.

| Setting | range [°C] | range [°F] | Factory setting |
|---------|-------------|--------------|-----------------|
| S0 | -40...60 °C | -40...160 °F | ✓ |
| S1 | 0...50 °C | 40...140 °F | |
| S2 | -15...35 °C | 0...100 °F | |
| S3 | -20...80 °C | 0...200 °F | |

Dimensions

